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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/676,487	10/02/2000	Hirotaka Matsumoto	Q61016	4933

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EXAMINER
CLARKE, YVETTE M

ART UNIT	PAPER NUMBER
1752	9

DATE MAILED: 05/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/676,487	MATSUMOTO ET AL.	
	Examiner	Art Unit	
	Yvette M Clarke	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *3-8 and 11-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,2,9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This is written in reference to application number 09/676,487 filed on October 20, 2000.

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims 1-2 and 9-12, drawn to a photopolymerizable composition of given formula (1) and recording material thereof, classified in class 430, subclass 270.1.

   II. Claims 3-4 and 13-16, drawn to a photopolymerizable composition of given formula (2) and recording material thereof, classified in class 430, subclass 270.1.

   III. Claims 5-6 and 17-20, drawn to a photopolymerizable composition of given formula (3) and recording material thereof, classified in class 430, subclass 270.1.

2. The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II; I and III; and II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are photopolymerizable compositions comprising three different compounds represented by formulae 1, 2 and 3, respectively.

4. Because these inventions are distinct for the reasons given above and the search required for each of groups I, II and III are different, restriction for examination purposes as indicated is proper.

5. This application contains claims directed to the following patentably distinct species of the claimed invention: an polymerizable ethylenically unsaturated compound wherein **(1)** the compound has a site which reacts with the color forming component and causes the color-forming component to develop a color (cl. 9, 13 and 17); and **(2)** the compound has a site which inhibits the reaction between the color-forming component and the color forming compound (cl. 11, 15 and 19).

6. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-2 of group I; claims 3-4 of group II; and claims 5-8 of group III are generic.

7. Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

8. Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims

are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

9. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

10. **Applicant's election without traverse of Group I, claims 1and 2 and Species 1, claims 9 and 10 in Paper No. 7 is acknowledged**.

Information Disclosure Statement

11. The Information Disclosure Statement filed on January 30, 2001 has been entered and fully considered.

Priority

12. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

13. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The structure of general formula (4) fails to contain the claimed Z1 or Z2 substituent of the claimed formula 1. It

is unclear to the examiner how Z1 and Z2 together can form a double bond. Claim 1 as written requires Z1 and Z2 to "each independently represents a substituent necessary for the compound . . . to become a dye".

Claim Rejections - 35 USC § 112

14. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

15. Claims 1-2 and 9-10 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 as written says the Z1 and Z2 *each independently* represent a substituent necessary for the compound to become a dye. The term "each independently" suggests the requirement of two separate substituents. The examiner has failed to find support in the specification wherein Z1 and Z2 each independently represents a substituent. All the given examples teach Z1 and Z2 together forming a double bond, which is one substituent not two as disclosed by instant claim 1.

16. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

17. Claim 1-2 and 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

18. Claim 1 as written requires Z1 and Z2 to "each *independently* [represent] a substituent necessary for the compound. . . to become a dye". It is unclear to the examiner how Z1 and Z2 together can form a double bond as depicted in claimed formula 4, which is an embodiment of formula 1. The examiner has failed to find any additional explanation or support in the specification, which clarifies how Z1 and Z2 can together form a double bond, and still meet the limitations of instant claim 1.

19. The following rejections are based on the teachings of the specification and the limitations of instant claim 2 wherein Z1 and Z2 can together form a substituent having a double bond, which is necessary for the claimed formula 1 to become a dye.

Claim Rejections - 35 USC § 102

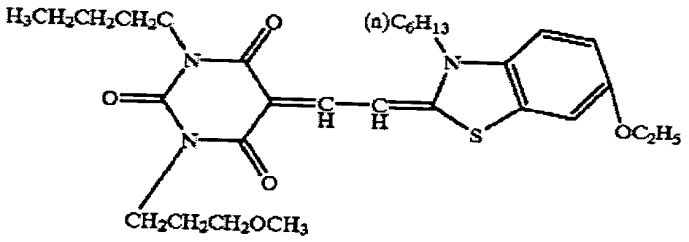
20. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

21. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Okubo et al. (US 5965324 A) with Nakayama et al. (US 5858617 A) cited to show inherent properties. Okubo teaches a light sensitive composition comprising a radical generating agent and a dye represented by formula (1), (2) or (3) (abstract). The said composition further comprises a compound having an ethylenically unsaturated bond (c. 3, l. 22-24). The said light sensitive composition comprising the radical generator, the dye, at least one ethylenically unsaturated compound, and a binder is coated on a hydrophilic

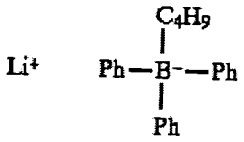
support and topped with a protective layer. Example 20 exemplifies a composition comprising D-22 which has the following structure:

D-22



; boronium salt compound as the radical generating agent; and pentaerythritoltetraacrylate M450 as the ethylenically unsaturated compound (see c. 19, l. 5-63; and table 1). It is the examiner's position that D-22 meets the limitations of claimed formula (1) and (4). Okubo exemplifies the use of a boronium salt compound as the radical generating agent, however the structure of the said compound is not provided. The prior art reference of Nakayama (US '617) discloses the structure of boronium salt to be:

Boronium salt



which meets the limitations of claimed formula (A). Okubo, specifically example 20, clearly anticipates the claim limitations of instant claim 2. It is the examiner's position that when the limitations of claim 2 are meet, the limitations of claim 1 are inherently meet since the applicant is stating the formula (4) further limits instant formula (1).

22. The examiner further notes that Okubo teaches a D-5 compound (c. 6, l. 35-45) which has a substituent having a single bond, however the examiner believes this is a

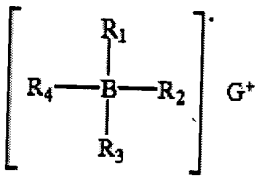
typographical error as the general formulae (1) and (2) from which the structure is derived, depict the use of double bonds.

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

24. Claims 1-2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cunningham et al. (US 6011180A) in view of the applicant's own disclosure and Okubo et al. (US 5965324A). Cunningham teaches a compound of given formula I:



wherein R_1 is C_{1-20} alkyl, or an unsubstituted or substituted phenyl group; R_{2-4} are independently of one another an unsubstituted or substituted phenyl or biphenyl group; and G^+ is a radical which is able to form a positive ion (abstract). The examiner is of the position that the taught formula (I) meets the limitations of claimed formula (A). The taught invention provides for a composition comprising (a) at least one ethylenically unsaturated compound; (b) at least one compound containing an acidic group which may also be present n component (a); (c) at least one photoinitiator of the given formula (I); and (d) if desired, at least one coinitiator (c. 3, l. 5-16). If the compounds of formula (I) do not contain a dye as

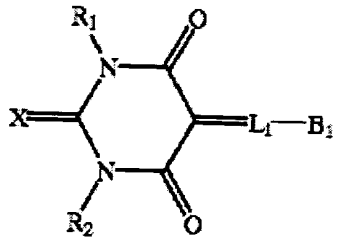
counterion and at the same time the corresponding borate is not sufficiently absorptive, then it is expedient for the photopolymerization process to add at least one coinitiator or electron acceptor compound (d) to the composition (c. 8, l. 1-5). Suitable examples include triarylmethanes, indolines, thiazines, xanthones and acridines (c. 8, l. 9-2c. 10, l. 42). The unsaturated compounds suitable as component (a) include esters of ethylenically unsaturated carboxylic acids and polyols or polyepoxides and polymers having ethylenically unsaturated groups in the chain or in side group. Examples of unsaturated carboxylic acids are acrylic acid, methacrylic acid and cinnamic acid (c. 17, l. 64-c. 18, l. 10). It is the examiner's position that the taught ethylenically unsaturated compounds (i.e., methacrylic acid and acrylic acid) meet the limitations of the instant claims. Applicant's own disclosure on page 93, line 4-page 95 discloses that methacrylic acid and acrylic acid are suitable examples of compounds having in the molecule an electron accepting group and a polymerizable group.

Cunningham teaches that compounds suitable as component (b) are those, which are acids or carry and acidic group or are attached as ligands or counter ions. Dyes such as methyl red hydrochloride and ethyl orange and acid yellow are also suitable as compounds of component (b). The said component may likewise consist of pigments, fillers or inorganic auxiliaries, which contain acidic groups. (c. 19, l. 51-c. 20, l. 60). It is the examiner's position that the use of the taught dyes constitutes a color former material as set forth in instant claim 9.

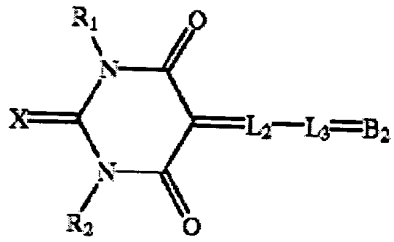
Cunningham further teaches that preference is given to compositions in which the coinitiator (d) is a dye or UV absorber. Particularly preferred composition are those

containing cyanine, merocyanine, azo, diazo, acridine, coumarin and xanthene derivatives as dye. In addition to the photoinitiator (c), the photopolymerizable mixtures may include various additives. Examples include thermal inhibitors, copper compounds, UV absorbers and light stabilizers (c. 21, l. 58-c. 22, l. 22). Further customary additives, depending on the intended use, are fluorescent whiteners, fillers, pigments, dyes, and leveling assistants (c. 24, l. 41-46). The compounds according to the invention finds application for the production of one or more layered material for the image recording or image reproduction which may be unichromatic or polychromatic. Furthermore, the materials are suitable for color proofing systems. In this technology formulations containing microcapsules can be applied and for the image production the reaction can be followed by a thermal treatment (c. 28, l. 57-67).

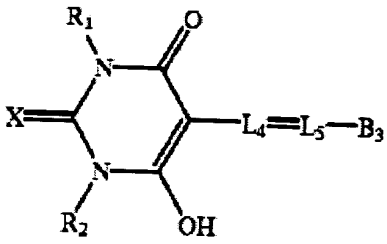
The prior art reference of Okubo et al. (US5965324A) teaches that a combination of a methane dye, azo dye, azomethine dye, or dimethine dye of the barbituric acid or thobarbituric acid type with a radical generating agent shows unexpected results providing high sensitivity and excellent storage stability. The said dyes are represented by the given formulae:



(1),



(2) and



(3) . The said formulae (1) and (2) meet the limitations of claimed formula 4 when X=oxygen. One of ordinary skill in the art would have been motivated by the teaching of Okunbo to use the dye compounds of formulae (1) or (2) of Okubo as the taught (d) component of Cunningham in order to have a composition which shows unexpected results providing high sensitivity and excellent storage stability.

25. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cunningham et al. (US 6011180A) in view of the applicant's own disclosure and Okubo et al. (US 5965324A) as applied to claims 1-2 and 9 above, and further in view of Gottschalk (US 4772541A). One of ordinary skill would have been motivated by the teachings of Cunningham, as discussed above, to use the taught composition to make a multi-layered polychromatic material containing microcapsules. It would have been obvious to one of ordinary skill to make the said multilayer polychromatic microcapsulate systems contain three photopolymerizable dispersions provided on a support in three separate layers as it is well known in the art. This position is supported by the background teachings of Gottschalk (US 4772541A), which teaches that systems are known which comprise photopolymerizable dispersion on support in three separate layers. One layer which contains a yellow color former and is sensitive to blue light; a second layer which contains a magenta color former and is sensitive to green light; and

a third layer which contains a cyan color former and is sensitive to red light (c.2, l. 18-42).

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Tsien et al. (US 6107066A) which teaches the detection of transmembrane potentials by optical methods (see formula I).
- Washizu et al. (US 6022664A) which teaches a light and heat sensitive recording material. The examiner notes that the said reference is commonly assigned to the instant application.
- Nakayama et al. (US 5858617A) which teaches a photopolymerizable composition and presensitized planographic printing plate employing the same.
- Yoshinaga et al. (US 5618856A) which teaches visible light sensitizer for photopolymerizing initiator and/or photocrosslinking agents.
- Kawamura et al. (US 5061605A) which teaches photopolymerizable compositions containing photoinitiators having at least two sulfur atoms.
- Kawamura et al. (US 4636459A) which teaches photopolymerizable compositions.
- Okubo et al. (EP 821276A1) which teaches a light sensitive composition and method for manufacturing planographic printing plates.
- Miyake et al. (EP 591786A2) which teaches photosensitive compositions comprising a sensitizer of formula (I).

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette M Clarke whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Baxter can be reached on 703-308-2303. The fax phone numbers for

the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

28. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193.

ymc
April 30, 2002

ROSEMARY ASHTON
PRIMARY EXAMINER